# Enhancing K-12 Science Education Via Satellite-Televised Interactive Technologies

Dr. Paula G. Coble, Assistant Professor
Dr. Sarah Tebbens
Teresa Greely
Dr. Margaret Hewitt
Department of Maine Science
University of South Florida
140 Seventh Ave. S.
St. Petersburg, FL 33701
(727)553-1631
(727)553-1189FAX

Award # N00014-97-1-1040
http://www.marine.usf.edu/pjocean

## LONG-TERM GOAL

To support of the goals of the NOPP Education, Outreach, and Training activities by providing a telepresence for science education and developing K-12 marine science curriculum and supplemental activities.

## OBJECTIVES

Expansion of outreach activities via television represents a new partnering between a research university and public education. Expected results include increased participation by under-represented groups by providing all telecasts and supporting educational materials at no charge to schools of all sizes anywhere in the U.S.

## APPROACH

Project Oceanography, a televised program on a variety of Ocean Science topics, is designed to provide recent, relevant research results embedded with the required physics, chemistry, geology, biology, or mathematics needed by the student to fully comprehend the causes and implications of the real-world environmental problems. Presented by the actual research scientists, middle school science students and teachers are exposed to the wealth of knowledge, resources, and state-of-the art facilities of the Ocean Science research community. Real-time interactivity is possible via two-way audio and video technologies, and programs can originate virtually anywhere on the planet.

## WORK COMPLETED

During the past year, we have produced 29 half-hour live broadcasts on various topics in Marine Science, including Coral Reefs, Ocean Drifters (Plankton Ecology), Ocean in Motion (currents, carbon dioxide and CFCs in seawater, weather and climate, El Nino and hurricanes), Natural Disasters (Lightning , Tornadoes, and Tsunamis) Aquaculture/ Habitat Restoration with an emphasis on scallops, Careers, and YOTO Drifters. In addition, we wrote, printed and distributed background

# Report Documentation Page

*Form Approved*
*OMB No. 0704-0188*



| 1. REPORT DATE | 2. REPORT TYPE | 3. DATES COVERED |
|---|---|---|
| **1998** | | **00-00-1998 to 00-00-1998** |

| 4. TITLE AND SUBTITLE | 5a. CONTRACT NUMBER |
|---|---|
| **Enhancing K-12 Science Education Via Satellite-Televised Interactive Technologies** | 5b. GRANT NUMBER |
| | 5c. PROGRAM ELEMENT NUMBER |
| 6. AUTHOR(S) | 5d. PROJECT NUMBER |
| | 5e. TASK NUMBER |
| | 5f. WORK UNIT NUMBER |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **University of South Florida,Department of Maine Science,140 Seventh Ave. S.,St. Petersburg,FL,33701** | 8. PERFORMING ORGANIZATION REPORT NUMBER |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | 10. SPONSOR/MONITOR'S ACRONYM(S) |
| | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) |

12. DISTRIBUTION/AVAILABILITY STATEMENT
**Approved for public release; distribution unlimited**

13. SUPPLEMENTARY NOTES
**See also ADM002252.**

14. ABSTRACT

15. SUBJECT TERMS

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON |
|---|---|---|---|---|---|
| a. REPORT | b. ABSTRACT | c. THIS PAGE | | | |
| **unclassified** | **unclassified** | **unclassified** | **Same as Report (SAR)** | **3** | |

information packets for each of units listed above, totaling over 268 pages. Videotapes of all programs were edited and distributed. Copies of all videotape and written materials are available on request. Evaluation of program's impact on teachers and students is underway.

**RESULTS**

We experienced a 75% increase in number of registered sites from 97 to 250, as of 12/15/98. Our estimated weekly viewership is roughly 1,600,000 in approximately 2,650 schools.

Results of teacher surveys:

1. Content of broadcasts is appealing to all grades of middle school students, and all types of learners, including gifted students, students with physical and emotional disabilities, and at-risk students in Juvenile Welfare (drop-out prevention) programs.

2. Complete, well-designed packets support state and national science standards. Materials emphasize broad concepts and integrate well across science disciplines. Activities are included which require higher-order thinking skills and engage students in 'hands-on' investigations.

3. Broadcasts bring research science to students, which is something that is otherwise lacking in their science education experience.

4. The abundance and completeness of materials allow the teacher to pick and choose activities which best meet certain standards, and also help teachers offer an interdisciplinary unit. Many teachers intend to incorporate materials into their curriculum in future years.

5. Web-based information would be extremely beneficial.

6. Overall program rating from teachers is A-.

Figures 1 and 2 show results of content surveys distributed to students before and after our Natural Disasters series showed a 22% increase in knowledge among magnet students, and a 40% increase among students with specific learning disabilities (SLD).

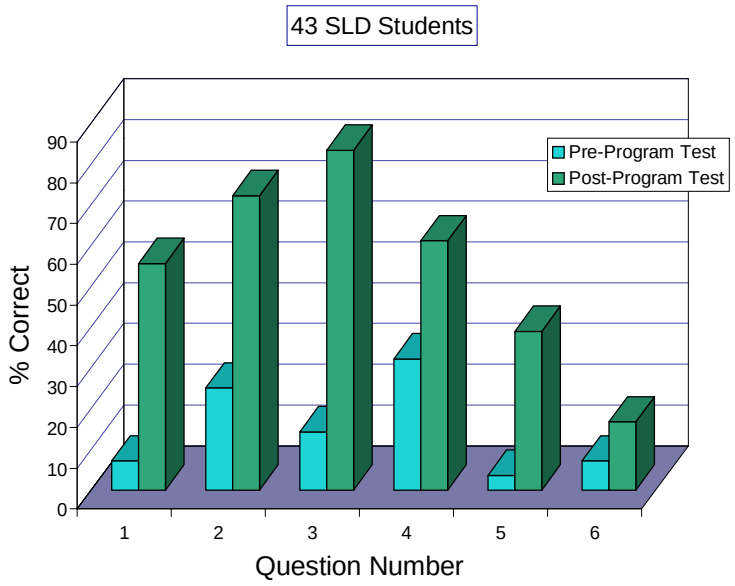


***Figure 1. Results of Project Oceanography Natural Disasters Content Survey with SLD students.***

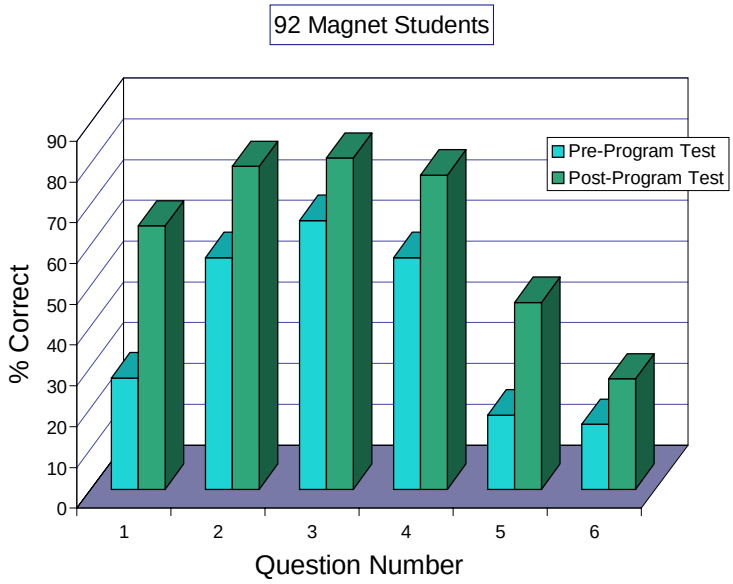


***Figure 2. Results of Project Oceanography Natural Disasters Content Survey with magnet students.***

## PUBLICATIONS

1. Tebbens, S.F., P.G. Coble, and T. Greely, 1998. "Teaching Marine Science to the Next Generation: from summer camps to weekly nationwide distance learning broadcasts" EOS 79:137.
2. Project Oceanography, 1997. Vol. I, Numbers 1-28. Dept. Marine Science, USF, St. Petersburg, FL. 193p. Videotapes and written materials.
3. Project Oceanography, 1998. Vol. II, Numbers 1-29. Dept. Marine Science, USF, St. Petersburg, FL. 268p. Videotapes and written materials.